

SUBSURFACE RESOURCES

The Willow Sub-basin possesses a wealth of known and potential mineral resources. The history of the sub-basin has been influenced considerably by the rise and decline of mining activities. The area is presently the focus of growing interest in gold, oil and gas, coal, and a number of other subsurface resources. This section presents a discussion of subsurface management issues, a brief inventory of the sub-basin's mineral resources, and an explanation of how sub-surface exploration and development is affected by this plan.

SUBSURFACE RESOURCE MANAGEMENT ISSUES

The principal management issues in the sub-basin are similar to those confronted throughout the state: locating and developing these resources and minimizing unwanted effects of their development on the surrounding countryside and communities. The following list summarizes subsurface management issues in the Willow Sub-basin.

1. Infrastructure

One hurdle in the development of subsurface resources in the sub-basin is the lack of an adequate supporting infrastructure. Developing the region's subsurface resources will require access to explore and develop these resources, processing facilities, and the means to transport these resources from mine sites and processing areas to their final users. In addition, markets for some of these resources need to be explored and developed.

2. Protection of Surface Resources

Many of the known and potential mineral areas in the sub-basin are overlain by valuable surface resources. Mining could potentially have serious negative impacts on these resources. On the other side of the picture, efforts to protect surface resources from the unwanted side effects of mineral development can be so burdensome as to make mining impossible. There are numerous specific issues within this general category, several of which are listed below:

- a. Conflicts between Mining and Surface Uses: Specific areas where conflicts between surface uses and mining are likely to occur are as follows:
 - Hatcher Pass/Willow Creek Mining District
 - Anadromous Streams/River Recreation Corridors

- ° Residential and other developed areas where the surface is privately owned and the subsurface is publicly owned and therefore potentially open to some forms of mineral development.
- b. Placer Mining: Settling ponds and other standard procedures to protect water quality and streambed quality from the adverse effects of placer mining are costly and not always successful.
- c. Existing Permit and Regulation System: A system of permits, regulations, performance standards, etc., that can adequately protect the environment, that can be implemented with available staff and funds, and that also allows mineral development to occur in an economic fashion is not currently in existence in Alaska. State agencies responsible for issuing and monitoring water quality permits, anadromous stream permits, and miscellaneous land use permits do not always have the time or the staff to review each mining claim carefully or check compliance to permit stipulations in the field. In addition, there are communication problems between the various agencies responsible for this process.

A SUMMARY OF SUBSURFACE RESOURCES

COAL

Coal deposits in the Willow Sub-basin have been known and worked since the early 1900's. The Matanuska Coal Field extends into the area from the east, overlapping the Susitna Coal Field which extends into the northwestern regions of the sub-basin (see Map 16). The coal in this area is subbituminous.

Commercial use of coal in the Willow Sub-basin has been limited to a small mine near Houston which has operated intermittently since 1917. This mine is presently closed, and the city is seeking funds for rehabilitation.

Future prospects are difficult to predict. Hypothetical reserves of the sub-basin down to 1000 feet exceed 14 million short tons; however, existing data suggest beds are discontinuous and relatively thin. Ratios of the thickness of overburden to the thickness of the coal seams appear to make coal mining uneconomical. Geologists familiar with the area seem to agree other areas of the state are more likely prospects for development over the next 10 to 20 years. (Based on discussions with geologists at the State Division of Geological and Geophysical Surveys).

OIL AND GAS

The Willow Sub-basin is part of the Cook Inlet and Susitna sedimentary basins (Map 17). Interest in the sub-basin portions of these sedimentary basins has been fairly steady over the years; however, there have been no commercial finds to date.

Because these basins have produced commercial wells in other parts of Cook Inlet, petroleum geologists feel this area has definite potential. This opinion was reinforced when tracts in the Willow Sub-basin received the highest bids by industry in recently held state Oil and Gas Lease Sale No. 33. Another oil and gas lease sale, number 40, is scheduled in the area for the third quarter of 1983. Only future exploration will answer questions regarding the sub-basin's potential as an oil and gas producer.

METALLIC METALS

The Talkeetna Mountains' portion of the sub-basin (Map 16) has produced millions of dollars in gold in the last 80 years. Other minerals that have been found in the area (principally as a spin-off of gold mining) include tungsten, copper, mercury, molybdenum, and nickel.

High operating costs combined with a ceiling on gold prices effectively kept mines closed after they were temporarily shut down by federal decree during World War II. In more recent times, surging gold prices have resulted in a high level of interest in the area. Both placer and hardrock mining and exploration is occurring in earnest on the area's numerous claims (both patented federal and those staked on state land). The Independence Mine, largest operator in the area, currently employs 70 people year round.

Future activity will be determined by the success of the Independence Mine and several adjacent projects. It appears probable, however, that with high gold prices, mining on both small and large scales is likely to continue.

Development of other metals is more uncertain. Development will depend on discovery of additional deposits, changes in minerals markets, and the effects of government policy.

NONMETALLIC MINERALS

A variety of useful nonmetallic minerals occur in the Willow Sub-basin. Like other minerals discussed however, prospects for commercial development are generally uncertain. A partial list of nonmetallics occurring in the Willow Sub-basin is provided on the page following Maps 16 and 17.

NONMETALLIC MINERALS

TYPE	USE	LOCATION	CURRENT* ACTIVITY
Quartz Sand	Abrasives	Willow Creek, Little Susitna River	Minimal
Phosphorus, Potassium	Fertilizers, Chemical Products	By-product of Matanuska Coal Field	None
Clay	Brick Making, Ceramics	Little Susitna, Fishhook Creek	Minimal
Lime (Marl)	Various Uses	Big Lake, Wasilla, Lucille, Finger Lakes	None
Soapstone	Jewelry	Grubstake Gulch near Willow Creek	Moderate
Sand Gravel	Roads, Construction	Throughout the Sub-basin - see discussion under Transportation	Heavy
Sandstone, Marble	Construction	Periphery of Talkeetna Mountains	None

* Information on current activity is the result of limited research. Any corrections or additions by people familiar with this area would be appreciated.

LAND USE DESIGNATIONS

The large majority of state-owned subsurface areas in the Willow Sub-basin are currently open to exploration and development of subsurface resources and will remain open under this land use plan.* However, an important effect of this plan is that it closes certain areas to specific types of subsurface resource exploration and development. The following section describes the areas closed by the plan. It is important to note that these mineral closures and other policies resulting from this plan do not alter or replace existing regulations, nor do they affect any existing mineral closures in the area. The areas closed to mining described below are closed only to new exploration or development activities; any existing leases, prospecting permits, or claims will not be affected. (Mineral closing orders will be prepared for these areas in compliance with AS 38.05.185.)

- a. Areas closed both to mineral leasing and to locatable mineral entry by this plan**

The Little Susitna River Corridor Management Unit is closed to all mineral leasing and to locatable mineral entry.

- b. Areas closed only to locatable mineral entry by this plan

Under current department policy, areas sold by the state for residential or agricultural purposes -- including those identified by the plan -- are closed to all locatable mineral entry. (These sale areas may, on a case-by-case basis, be open to development of leasable minerals.)

* The State retains subsurface rights when it transfers land to local governments or private owners. Consequently all subsurface rights in the sub-basin, with two notable exceptions, are held by the State and are subject to the policies in this plan. The first exception is certain private lands that were homesteaded and passed directly from federal to private ownership. Private land of this type comprises a relatively small percentage of the sub-basin's area, less than 5 percent (mostly in the Willow and Wasilla areas). The second exception is lands granted to Native regional and village corporations. Under the terms of the Alaska Native Claims Settlement Act, Native Corporations received both surface and subsurface rights. These lands make up about 1 percent of the sub-basin's area.

** "Leasable" minerals include oil and gas, coal, and geothermal resources. Development rights are acquired either at a lease sale, (the method always used for oil and gas) or non-competitively (by applying for a prospecting permit). Minerals such as gold, silver, copper, iron, asbestos, and uranium, are "locatable;" rights to these minerals are acquired by staking a mining claim.

c. Areas Closed To Coal Prospecting

Certain areas with exceptionally high surface resource values are closed to the issuance of coal prospecting permits*; these areas are described below:

-Large blocks of class II and III soils: The Point MacKenzie project and potential agricultural areas in the Fish Creek and Susitna Corridor Management Units.

-River Corridors: Little Susitna River, Little Willow Creek, Willow Creek, and the Big Susitna River.

The Little Susitna River: all of the Little Susitna River Management Unit and a corridor 300 feet on either side of the river over the remainder of the river's course.

Little Willow Creek: the portion of Little Willow Creek Management Unit east of where the railroad crosses the river and a corridor 300 feet on either side of the river over the remainder of the river's course.

Willow Creek: Willow Creek Management Unit and a corridor 300 feet on either side of the river over the remainder of the river's course.

Big Susitna River: a corridor at least $\frac{1}{4}$ mile on either side of the river (note: the eastern bank of the river forms the boundary to the study area).

-Recreation sites identified on the recreation map of this plan (Appendix 2). (These are primarily small sites -- less than 160 acres -- used for campgrounds, waysides, boat launches and access sites on water bodies and along trails.)

-A corridor 300 feet wide on either side of the Parks Highway right-of way to protect visual quality.

-Nancy Lake State Recreation Area.

-The proposed state capital site at Willow.

-All past and planned (through 1987) state subdivisions and the portions of state remote parcel sales areas like to be staked.

See Chapter III, Subsurface Resources, for additional policies and management guidelines affecting subsurface development in the Willow Sub-basin.

* Under State law, once a coal prospecting permit is issued, the state is required to grant the permit holder a coal lease if coal is found in commercial quantities. Any coal mining that occurs after a lease is issued would be subject to state, federal and local mining regulations.